<u>REMARKS</u>

Claims 1-2, 4-33, 35-43, and 75-77 are currently pending and under examination. Claims 1, 16, 32 and 75 have been amended. Support for the amendments can be found throughout the application as filed including, for example, page 3, lines 24-27; page 18, lines 22-26; page 19, line 16 through page 20, line 11; page 25, lines 14-15; page 29, lines 2-6; page 31, lines 4-10, and page 102, lines 20-24. Accordingly, the amendments do not raise an issue of new matter and entry thereof is respectfully requested. Applicant has reviewed the rejections set forth in the pending Office Action and respectfully traverse all grounds for the reasons that follow.

### Rejection Under 35 U.S.C. § 102 Over Rine et al.

Claims 1, 2, 4-33, 35-43 and 75-77 stand rejected under 35 U.S.C. § 102(b) as allegedly anticipated by Rine et al. The Examiner alleges that the purported description in Rine et al. of detection of physical signals from each unit in a stimulated physical matrix, transforming the signals into electrical output signals and storing them into a data structure associating each output signal with the X and Y coordinates of the physical matrix anticipates the claimed data integration map.

Applicants submit that the Examiner fails to give patentable weight to Applicants' showing that Rine et al. fail to teach the integration of different types data elements into each values set and respectfully point out that the claimed invention is directed to elements which the cited reference fails to teach. Applicants further point out that the distinctions of record have been deemed unpersuasive apparently because the comparison of output signals disclosed in Rine et al. has been incorrectly analogized to the claimed data element integration.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." M.P.E.P. § 2131 (quoting *Verdegaal Bros. v. Union Oil Co.* of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)) (emphasis added). A rejection under § 102 is proper only when the claimed subject matter is identically described or disclosed in the prior art. *In re Arkley*, 455 F.2d 586, 587 (CCPA 1972); M.P.E.P. § 706.02.

The Claims 1, 16, 32 and 75 recite that each data integration map comprises a value set containing two or more different types of data elements <u>wherein, the different types of data elements are integrated into each of the value sets</u>. As set forth throughout the application and in the claims, the different types of data elements integrated into a each value set can include, for example, nucleic acid expression, protein expression, polypeptide-polypeptide interaction, nucleic acid-polypeptide interaction, metabolite abundance and growth rate. The claimed value sets integrate two or more of these different types of data elements into a single value set. Rine et al. fails to describe such an integration of different types of data elements.

The Examiner appears to rely on output signals generated from X and Y coordinates from a stimulated physical matrix of responder cells to maintain that Rine's measurement system anticipates the claimed invention. None of the stimulated physical matrix, the output signals, the output signal matrix or the X and Y coordinates for responders in the described stimulated physical matrix teach Applicants' claimed integration of different types of data elements into each value set.

For example, the stimulated physical matrix of responders consists of an ordered array of units having X and Y coordinates which confines (1) either a different responder of a living thing or a probe for that responder and (2) an identifier for the responder or probe (see, for example, col. 2, lines 30-34). The responder is provided a stimulus and the response to the stimulus reflects the cell's transcriptional adjustment (col. 3, lines 44-59). The identifier can consist of a reporter gene, for example, which provides a gene expression readout for each different responder, or unit, on the matrix (col. 4, lines 8-30). Other identifiers can be used where each identifier reports on a different responder or unit of the matrix (*Id*). The physical signal from an identifier is detected and transformed into an electrical output signal and stored in an output matrix data structure (see, for example, col. 4, line 31 through col. 5, line 5).

The different responders or probes are separated into different X and Y locations and there is no integration of data elements into a value set because the units are separated. The X and Y coordinates or their association with each output signal also fail to teach integration of two different types of data elements because each X coordinate and each Y coordinate is the same type of data element, namely, both X and Y coordinates are types of data elements that convey a

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location within the physical matrix. Similarly, each identifier reports on a separate unit so this component of Rine's measurement system fails to teach integration of two or more different types of data elements. Because each identifier reports on a separate unit and there is no teaching of combining signals from different identifiers, the measurement of different types of responses within the matrix also cannot describe the invention as claimed because there is no integration of such different signals obtained from the different types of identifiers into a single signal. The stimulus also cannot be said to be an integration of data elements because it is the agent that is delivered to the matrix to invoke a response from each unit. Similarly, the physical signal cannot be interpreted to be an integration of different types of data elements because each signal is produced from an individual responder unit within the matrix. Transformation and storage into an output matrix also fails to integrate data elements because this component merely converts a signal form one form to another form.

Accordingly, Rine et al. fails to describe the integration of two or more different types of data elements integrated into each value set as claimed. Absent some teaching of the integration of two or more different types of data into a each value set Rine et al. cannot anticipate the claimed invention and this ground of rejection is respectfully requested to be withdrawn.

### Rejection Under 35 U.S.C. § 102 Over Thalhammer-Reyero

Claims 1-2, 4-33, 35-43 and 75-77 stand rejected under 35 U.S.C. § 102(e) as allegedly anticipated by Thalhammer-Reyero (U.S. Publication No. 2005/0273305). The Examiner alleges that Thalhammer-Reyero describe a method for modeling and simulation of biochemical networks using a first integration map of a biochemical system having value sets of two or more data elements and comparing it to a second data integration map obtained under perturbed conditions.

The Examiner cites to various paragraphs alleging that Thalhammer-Reyero describes the "integration of a variety of forms of knowledge representation[s]" (Office Action at page 9). Such alleged integration of knowledge representations are distinct from the claimed integration of data elements because there is no teaching of integrating at least two different types of data elements into each value set.

In this regard, Thalhammer-Reyero merely appears to describe a modeling system for comparing biochemical representations. For example, paragraph 0003 generally describes that Thalhammer-Reyero's invention relates to a computer-based system for providing an integrated development and deployment framework for visual modeling and simulation. The system can be further integrated with monitoring and control devices. Thus, paragraph 0003 is directed to combining a computer development and a computer deployment framework into one system and further combining into the system computer monitoring and control devises. There is no teaching in this paragraph of integrating different types of data elements into each value set as claimed.

Paragraph 0006 describes background on systems for monitoring and controlling industrial process containing microorganisms or mammalian cells. It describes that current systems monitor very general types of phenomena that are poor indicators of production and that most systems do not model compartmentalized subsystems to finely tune productivity. Paragraph 0006 concludes that detailed and mechanistic models of reaction pathways would be desirable for monitoring and control system is industrial process. There is no teaching of integrating different types of data elements into each value set as claimed. Rather, this paragraph describes the current drawbacks and desirability of producing computer simulations that reproduce reaction pathways in cellular systems for monitoring and controlling industrial processes.

Paragraphs 0014-0017 merely describe the computer-based system for providing an integrated development and deployment framework for visual modeling and simulation in further detail compared to paragraph 0003. Paragraph 0014 distinguishes Thalhammer-Reyero's invention from a knowledge representation previously known in the art. The distinction of one type of knowledge representation over another fails to describe the integration of different types of data elements as claimed. While this paragraph states that Thalhammer-Reyero's invention integrates knowledge representations, this statement falls short of describing the claimed integration of different types of data elements because any integration of data elements, if at all, is all of the same type. Namely, data elements representing knowledge. Paragraphs 0015-0016 essentially reiterate that described in paragraphs 0003 and 0006 while paragraph 0017 describes the different methods for representing knowledge data elements in a computational system.

Thus, these paragraphs cannot describe the claimed because there is no teaching of integrating different types of data elements into each value set as claimed.

Paragraph 0020 merely describes the computational architecture used to perform the computer modeling and which produce the network for further reasoning and simulation of the program. Describing a computer architecture and its relationship of modules to one another fails to describe integration of different types of data elements into value sets.

Paragraph 0093 describes that the preferred embodiment is the integration of a variety of knowledge representation <u>techniques</u> for creation of virtual models of complex systems. As described previously, combining different methods for computer coding of knowledge information is distinct from the claimed invention because (1) combining different techniques or methods does not teach integration of different types of data elements, and (2) if any integration of data elements is occurring such data elements would all represent knowledge and be of the same type.

Paragraph 0453 fails to describe the integration of two different types of data elements because this paragraph merely describes cell growth rates in terms of net rate of protein accumulation. In particular, growth rates can be calculated based on measured single-cell protein content in the total cell population using equations developed by Kronenaker and Srienc, which are incorporated into the Thalhammer-Reyero's model. A calculation of growth rates using measured protein levels does not describe integration of two or more different types of data elements into a value set. Rather, it is the derivation of one characteristic estimated from a measured component.

Claims 142 is directed to generating a first and second representations of a biochemical pathway where a definition of a substance in the first representation is changed and comparing the first and second representations to determine an effect of the changed definition. This claim is silent as to the integration of two different types of data elements into each value set and, as described previously, such integration is absent in the description.

Claim 259 appears to be claim 16 copied from Applicants' application as filed. While the Examiner states that support for such a claim is found in the originally filed specification of

Thalhammer-Reyero, no such support has been cited to evidence this conclusory statement. Moreover, Applicants have shown that during copying of the claims no support was cited by Thalhammer-Reyero. Absent evidence to the contrary, Applicants respectfully submit that such support does not exist.

Applicants also have reviewed the specification and do not find any description for many of the elements recited in claim 259. For example, the only reference to integration Applicants have found refers to the integration of knowledge representations. However, as described above, such integration describes combining different components of a computer system or different knowledge representation techniques for creating a model. To the extent such a term is viewed by the Examiner to support the recited "data integration map," then claim 259 is distinct from Applicants claimed invention, because, as described previously, integration of computer components and knowledge representations differs from the from integration of different types of data elements.

Further, the terms "data integration map" or "integration map" are absent in Thalhammer-Reyero. The term "map" can be found, but Thalhammer-Reyero uses this term as a transitive verb rather than a noun. Hence, mapping something to a location does not support a description of a data integration map. Further, there is no description that Applicants have found which describes types of data elements nor the integration of different types of data elements. To the extent value sets containing two or more data elements is viewed supported by the Examiner, as described previously, Applicants respectfully point out that such a term is distinct from Applicants claimed integration of two or more different types of data elements. Additionally, the only mention of a correlation is at paragraph 0453 where Thalhammer-Reyero describes correlation of protein measurements with cell-cycle changes. Such a description is non-analogous and falls short of supporting the identification of correlative changes in at least two value sets as recited in claim 259. In light of the above remarks and the absence of any support cited by both the Examiner and Thalhammer-Reyero, Applicants respectfully submit that claim 259 and it's dependents lack support and cannot constitute prior art. Further, while not conceding that Thalhammer-Reyero is prior art, Applicants have pointed out for the Examiner's convenience that any description in Thalhammer-Reyero that appears to use similar words as

Applicants claims, such description is distinct and would fail to anticipate the invention as claimed.

Absent a description of the integration of two or more different types of data elements into each value set, Thalhammer-Reyero cannot anticipate the invention as claimed. Because Thalhammer-Reyero merely describes a computer model based on knowledge information this reference is distinct from the claimed invention and Applicants respectfully request that this ground of rejection be withdrawn.

## CONCLUSION

In light of the Remarks herein, Applicant submits that the claims are in condition for allowance and respectfully request a notice to this effect. Should the Examiner have any questions, she is invited to call the undersigned attorney.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 502624 and please credit any excess fees to such deposit account.

Respectfully submitted,

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